

# The Inland Waterways System and the Transport of Grain

## Commodities Transported

Grains are *building block* commodities which comprise a large portion of the traffic transported on the Nation's inland waterways system. On the shallow draft part of the system, there are more than 83 million tons of these commodities shipped on an annual basis, about 13 percent of total traffic on the system. These commodities have a market value of nearly \$9.6 billion.

As shown in Table 1, there are ten distinct commodities in this category. The leading commodity is corn, with 39.5 million tons transported annually on the system (47% of total grain) and a value of \$3.6 billion (38% of total grain value). Annual soybean traffic amounts to 20.5 million tons (25%) with value of \$3.4 billion (36%). Wheat is third at 10.5 million tons and value of \$1.2 billion (13% of both tons and value).

These three leading commodities – corn, soybeans and wheat – together comprise 83% of the tonnage and 86% of the value of the grain transported on the shallow-draft inland waterways system.

## Originating Traffic

Waterborne grain is loaded onto the inland waterway system in twenty-two states. Table 2 (and Figure 1) show the states of origin of all waterborne grains, with annual tons and commodity value. As expected, midwestern grain-producing states that are served by the waterways system are the leaders.

Illinois is the leading state of origin, by far, with 32.6 million tons originating (40% of total grain) and value of more than \$3.6 billion (39% of the value of waterborne grain). Iowa is next, followed by Minnesota and Missouri. These four states in the Upper Mississippi Region, account for 70% of the tonnage and 68% of the value of grain loaded onto the inland waterways system.

Figure 1

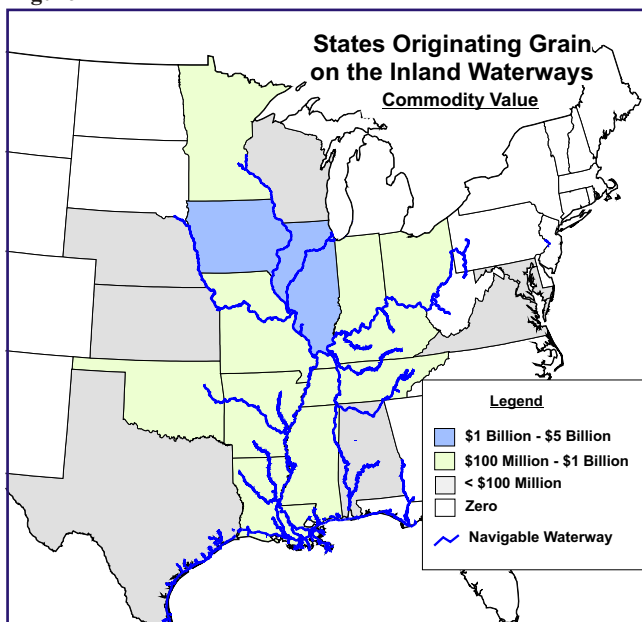


Table 1 - Waterborne Grain

Commodity	Average Annual Tons	2004 Value
Corn	39,502,000	\$3,597,500,000
Soybeans	20,552,000	\$3,425,400,000
Wheat	10,465,000	\$1,238,400,000
Prepared Animal Feed	6,658,000	\$665,800,000
Other Oilseeds	2,310,000	\$239,500,000
Rice	1,920,000	\$230,300,000
Sorghum Grains	1,301,000	\$118,500,000
Grain Mill Products	332,000	\$39,900,000
Barley & Rye	164,000	\$19,500,000
Oats	152,000	\$14,000,000
<b>Total</b>	<b>83,356,000</b>	<b>\$9,588,800,000</b>

Table 2 - Originating Waterborne Grain by State

State of Origin	Average Annual Tons	2004 Value
IL	33,631,000	\$3,727,800,000
IA	8,962,000	\$1,040,100,000
MN	8,557,000	\$953,700,000
MO	6,899,000	\$820,500,000
IN	3,723,000	\$415,100,000
TN	3,139,000	\$394,500,000
AR	2,889,000	\$384,300,000
WA	3,203,000	\$378,000,000
KY	3,102,000	\$364,300,000
MS	2,108,000	\$279,800,000
LA	2,202,000	\$251,900,000
OH	1,491,000	\$172,000,000
OK	1,293,000	\$154,900,000
WI	682,000	\$75,800,000
ID	600,000	\$70,700,000
VA	309,000	\$36,100,000
OR	305,000	\$36,000,000
AL	127,000	\$16,900,000
NE	61,000	\$6,800,000
MD	33,000	\$4,900,000
TX	21,000	\$2,800,000
KS	19,000	\$2,000,000

Since corn and soybeans are such major portions of waterborne grain, it is helpful to review separately the patterns of origins and destinations for these commodities. The states in which corn is loaded onto the system are listed in Table 2C, while states where soybean traffic is loaded are shown in Table 2S. The patterns for shipping these two grains is similar to the pattern for grain as a whole.

**Table 2C - Originating Waterborne  
Corn by State**

State of Origin	Average Annual Tons	2004 Value
IL	19,263,000	\$1,754,280,000
MN	5,671,000	\$516,500,000
IA	4,814,000	\$438,450,000
MO	3,094,000	\$281,750,000
IN	2,371,000	\$215,940,000
KY	1,605,000	\$146,170,000
OH	770,000	\$70,090,000
WI	485,000	\$44,180,000
LA	466,000	\$42,460,000
TN	388,000	\$35,300,000
MS	270,000	\$24,630,000
VA	146,000	\$13,280,000
AR	120,000	\$10,930,000
NE	22,000	\$1,960,000
KS	9,000	\$780,000
OK	2,000	\$180,000

**Table 2S - Originating Waterborne  
Soybeans by State**

State of Origin	Average Annual Tons	2004 Value
IL	7,550,000	\$1,258,320,000
IA	2,766,000	\$461,100,000
MN	2,098,000	\$349,660,000
MO	2,036,000	\$339,410,000
TN	1,002,000	\$167,090,000
AR	989,000	\$164,790,000
KY	925,000	\$154,220,000
IN	896,000	\$149,300,000
MS	861,000	\$143,440,000
LA	478,000	\$79,750,000
OH	424,000	\$70,710,000
WI	177,000	\$29,480,000
OK	148,000	\$24,640,000
VA	75,000	\$12,500,000
AL	55,000	\$9,250,000
MD	21,000	\$3,480,000
NE	13,000	\$2,200,000
TX	5,000	\$870,000

## Terminating Traffic

Grains are transported on the inland waterway system to 19 states, as listed in Table 3. Note that traffic to Louisiana is far greater than any other state, and comprises over 93 percent of total grain transported. This grain is believed to be moving through terminals in Louisiana to export. The next three leading states are also places where grain can be exported by transfer to ocean-going ships.

Figure 2 graphically shows the pattern for where grain is received by water.

**Table 3 - Terminating Waterborne Grain by State**

Destination State	Average Annual Tons	2004 Value
LA	73,565,000	\$8,447,700,000
OR	2,332,000	\$276,600,000
AL	2,278,000	\$252,500,000
WA	1,739,000	\$206,300,000
TN	1,242,000	\$118,500,000
IL	654,000	\$98,400,000
KY	263,000	\$43,800,000
VA	245,000	\$34,400,000
MS	323,000	\$32,600,000
TX	256,000	\$30,300,000
MD	137,000	\$13,800,000
AR	117,000	\$11,900,000
OK	55,000	\$5,400,000
IN	42,000	\$4,800,000
MO	31,000	\$3,400,000
MN	27,000	\$3,000,000
WI	23,000	\$2,400,000
PA	16,000	\$1,700,000
IA	11,000	\$1,200,000

**Figure 2**

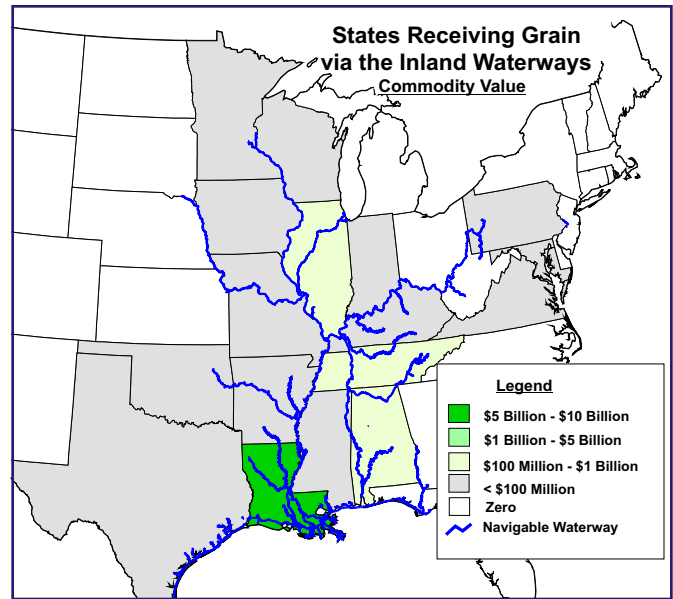


Table 3C shows the states where corn is received, while states receiving soybeans are given in Table 3S. Although there are fewer states where corn and soybeans are destined when compared with grain overall, these patterns are very similar to the patterns of grain received as a whole.

**Table 3C - Terminating Waterborne Corn by State**

Destination State	Average Annual Tons	2004 Value
LA	36,464,000	\$3,320,810,000
AL	1,508,000	\$137,291,000
TN	1,086,000	\$98,930,000
MS	171,000	\$15,610,000
MD	116,000	\$10,600,000
AR	66,000	\$6,050,000
IL	35,000	\$3,210,000
VA	30,000	\$2,700,000
MO	12,000	\$1,120,000
TX	12,000	\$1,050,000
IA	6,000	\$560,000
KY	2,000	\$150,000

**Table 3S - Terminating Waterborne Soybeans by State**

Destination State	Average Annual Tons	2004 Value
LA	19,074,000	\$3,179,060,000
AL	544,000	\$90,700,000
IL	503,000	\$83,770,000
KY	269,000	\$44,810,000
VA	131,000	\$21,800,000
MS	21,000	\$3,570,000
MD	15,000	\$2,450,000
AR	12,000	\$1,930,000
IN	6,000	\$960,000
MO	3,000	\$510,000
IA	3,000	\$450,000
MN	2,000	\$320,000
TX	2,000	\$260,000

## Economic Analysis

The value of grain moved by inland waterway – over \$9.3 billion – can be used in conjunction with input-output data and analysis to estimate its importance to the American economy. Using this form of economic analysis, output and jobs in the industries that produce and consume grain and in industries directly and indirectly linked to these industries have been estimated. Corresponding value added totals and aggregate tax revenues have also been estimated.

The analysis was adjusted to reflect the fact that a majority of the grain transported is not consumed within the United States, but goes to export.

### Principal findings:

There are 187,400 jobs directly associated with the production and consumption of grain transported on the inland waterways.

The Direct Output (a measure of business activity, similar to sales) that results from these 187,400 jobs has a value of \$13.6 billion.

The total number of associated jobs is 410,400 which includes indirectly linked jobs (in industries that directly and indirectly buy from and sell to any associated industries, including industries associated through employee expenditures).

The Total Output associated with these 410,400 jobs amounts to \$38.7 billion.

Direct Value Added is \$4.2 billion, while the Total Value Added exceeds \$17.5 billion. Value Added is used by economists as a measure of the increase in the value of goods as a result of the production process. Value Added is sales less the cost of intermediate goods (materials) and services.

## Impacted Industries

The analysis also shows output and employment associated with waterborne grain in each of the 505 industries which comprise the American economy, some of which are much more heavily impacted than others.

Table 4 shows the twenty most strongly linked industries in terms of employment. Note that the four leading industries, and six of the top eight, are associated with agriculture.

There are also several industries not usually associated with water transport (e.g., Real Estate, Food Services and Drinking Places; Hospitals) which are also substantially linked to this commerce. This is because they are major factors in the American economy and they are linked to activity in many other industries.

There are 51 separate industries with more than 1,000 jobs associated with waterway transportation of grain.

**Table 4 - Most Strongly Linked Industries - Jobs**

Industry	Employment (Jobs)	
	Direct	Total
Grain farming	70,383	87,100
Oilseed farming	68,256	74,999
Cattle ranching and farming	30,173	39,367
Agriculture and forestry support activities	0	25,585
Wholesale trade	0	12,407
Real estate	0	11,347
Animal production- except cattle and poultry and e	9,198	10,397
All other crop farming	0	9,337
Food services and drinking places	0	9,242
Employment services	0	4,286
Truck transportation	0	3,664
Poultry and egg production	3,209	3,517
Hospitals	0	3,437
Offices of physicians- dentists- and other health	0	3,205
Insurance carriers	0	2,997
Automotive repair and maintenance- except car wash	0	2,961
Other animal food manufacturing	2,531	2,866
Food and beverage stores	0	2,543
General merchandise stores	0	2,418
Services to buildings and dwellings	0	2,353

Table 5 shows the twenty leading industries in terms of output. As expected, Grain Farming and Oilseed (soybean) Farming have the highest associated output, at about \$8 billion combined.

Note from Table 5 that several of the most strongly linked industries are not often associated with waterborne commerce. They show up because they are major factors in the American economy and are linked through sales to or purchases from many other industries.

Output linkages are spread widely through the economy. There are 60 industries whose Total Output associated with waterborne grain is greater than \$100 million.

**Table 5 - Most Strongly Linked Industries - Output**

Industry	Output (\$Million)	
	Direct	Total
Grain farming	\$4,222	\$5,225
Oilseed farming	\$3,084	\$3,388
Cattle ranching and farming	\$2,265	\$2,956
Real estate	\$0	\$1,910
Wholesale trade	\$0	\$1,867
Other animal food manufacturing	\$1,346	\$1,524
Poultry and egg production	\$854	\$936
Agriculture and forestry support activities	\$0	\$755
Animal production- except cattle and poultry	\$614	\$694
Owner-occupied dwellings	\$0	\$643
Petroleum refineries	\$0	\$632
All other crop farming	\$0	\$628
Insurance carriers	\$0	\$622
Monetary authorities and depository credit	\$0	\$564
Truck transportation	\$0	\$491
Automotive repair and maintenance- except car wash	\$0	\$439
Hospitals	\$0	\$425
Pesticide and other agricultural chemical manufact	\$0	\$420
Food services and drinking places	\$0	\$400
Telecommunications	\$0	\$383

## Industrial Sectors

It is useful to group the results for individual industries into industrial sectors.

Table 6 shows the distribution of jobs associated with waterborne grain by sector.

Note that the sector that includes agriculture has the greatest total job impact with more than ten times any other sector.

Manufacturing is the next highest with nearly 22,000 jobs associated with waterborne grain.

Wholesale Trade, Retail Trade, Real Estate & Rental, and Health & Human Services are also substantially tied to grain moved on the waterways system.

**Table 6 - Employment (Jobs) by Industrial Sector**

Industrial Sector	Employment (Jobs)	
	Direct	Total
Agriculture, Forestry, Fishing & Hunting	181,218	251,707
Mining	0	1,679
Utilities	0	935
Construction	0	1,874
Manufacturing	6,163	21,711
Wholesale Trade	0	12,407
Transportation & Warehousing	0	10,913
Retail Trade	0	15,155
Information	0	3,955
Finance & Insurance	0	10,613
Real Estate & Rental	0	12,743
Professional - Scientific & Tech Services	0	10,846
Management of Companies	0	2,172
Administrative & Waste Services	0	10,414
Educational Services	0	2,492
Health & Social Services	0	12,767
Arts - Entertainment & Recreation	0	3,350
Accommodation & Food Services	0	10,791
Other Services	0	11,949
Government & Other	0	1,947
<b>Total</b>	<b>187,381</b>	<b>410,422</b>

The distribution of the Direct and Total Output by industrial sector is shown in Table 7.

Note that the sector which includes Agriculture is the highest at \$14.7 billion in Total Output. This is followed by Manufacturing at \$7.7 billion.

Six other sectors – Wholesale Trade, Transportation & Warehousing, Finance & Insurance, Real Estate & Rental, Professional Services, and Health & Social Services -- each have more than \$1 billion in Total Output associated with waterborne grain.

**Table 7 - Output by Industrial Sector**

Industrial Sector	Output (\$Million)	
	Direct	Total
Agriculture, Forestry, Fishing & Hunting	\$11,039	\$14,733
Mining	\$0	\$538
Utilities	\$0	\$492
Construction	\$0	\$176
Manufacturing	\$2,596	\$7,737
Wholesale Trade	\$0	\$1,867
Transportation & Warehousing	\$0	\$1,300
Retail Trade	\$0	\$838
Information	\$0	\$906
Finance & Insurance	\$0	\$1,957
Real Estate & Rental	\$0	\$2,384
Professional - Scientific & Tech Services	\$0	\$1,089
Management of Companies	\$0	\$287
Administrative & Waste Services	\$0	\$558
Educational Services	\$0	\$125
Health & Social Services	\$0	\$1,099
Arts - Entertainment & Recreation	\$0	\$174
Accommodation & Food Services	\$0	\$523
Other Services	\$0	\$960
Government & Other	\$0	\$956
<b>Total</b>	<b>\$13,635</b>	<b>\$38,697</b>

**Table 8 - Associated Tax Payments**

	Taxes Paid (\$Million)	
<b>Federal Government</b>		
Corporate Profits Tax	\$406	
Indirect Bus Tax: Custom Duty	\$45	
Indirect Bus Tax: Excise Taxes	\$145	
Indirect Bus Tax: Fed NonTaxes	\$51	
Personal Tax: Estate and Gift Tax	\$0	
Personal Tax: Income Tax	\$1,081	
Personal Tax: NonTaxes (Fines- Fees	\$11	
Social Ins Tax- Employee Contribution	\$555	
Social Ins Tax- Employer Contribution	\$452	
<b>Total - Federal Government</b>		<b>\$2,746</b>
Corporate Profits Tax	\$69	
Dividends	\$1	
Indirect Bus Tax: Motor Vehicle Lic	\$12	
Indirect Bus Tax: Other Taxes	\$74	
Indirect Bus Tax: Property Tax	\$562	
Indirect Bus Tax: S/L NonTaxes	\$88	
Indirect Bus Tax: Sales Tax	\$701	
Indirect Bus Tax: Severance Tax	\$13	
Personal Tax: Estate and Gift Tax	\$0	
Personal Tax: Income Tax	\$236	
Personal Tax: Motor Vehicle License	\$14	
Personal Tax: NonTaxes (Fines- Fees	\$45	
Personal Tax: Other Tax (Fish/Hunt)	\$3	
Personal Tax: Property Taxes	\$5	
Social Ins Tax- Employee Contribution	\$3	
Social Ins Tax- Employer Contribution	\$9	
<b>Total - State / Local Government</b>		<b>\$1,835</b>
<b>Grand Total</b>		<b>\$4,581</b>

## Taxes

The analysis also resulted in rough estimates of tax payments tied to waterborne grain, as shown in Table 8.

The taxes paid in association with all linked activities amount to about \$2.7 billion in federal taxes and \$1.8 billion in state and local taxes, for a grand total of tax payments of about \$4.6 billion, associated with waterborne grain.

## Conclusion

This analysis shows the extent to which grain transported on the inland waterways system supports economic activity throughout the industries that make up the American economy.

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